FPL

L-2011-294
10 CFR 52.3

August 17, 2011

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

Re: Florida Power & Light Company
Proposed Turkey Point Units 6 and 7
Docket Nos. 52-040 and 52-041
Response to NRC Request for Additional Information Letter No. 029 (eRAI 5491) - Standard Review Plan Section 09.02.01 Station Service Water System

Reference:

1. NRC Letter to FPL dated July 6, 2011, Request for Additional Information Letter No. 029 Related to SRP Section 09.02.01 – Station Service Water System for the Turkey Point Nuclear Plant Units 6 and 7 Combined License Application

2. FPL Letter to NRC dated August 3, 2011, Schedule for Response to NRC Request for Additional Information Letter No. 029 (eRAI 5491) - Standard Review Plan Section 09.02.01 Station Service Water System

Florida Power & Light Company (FPL) provides, as attachments to this letter, its responses to the Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI) 09.02.01-2, 09.02.01-3, 09.02.01-4 and 09.02.01-5 provided in the referenced letter (Reference 1). The attachments identify changes that will be made in a future revision of the Turkey Point Units 6 and 7 Combined License Application (if applicable).

If you have any questions, or need additional information, please contact me at 561-691-7490.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 17, 2011.

Sincerely,

William Maher
Senior Licensing Director – New Nuclear Projects

WDM/ETC

D097
NRO

Attachment 1: FPL Response to NRC RAI No. 09.02.01-2 (RAI 5491)
Attachment 2: FPL Response to NRC RAI No. 09.02.01-3 (RAI 5491)
Attachment 3: FPL Response to NRC RAI No. 09.02.01-4 (RAI 5491)
Attachment 4: FPL Response to NRC RAI No. 09.02.01-5 (RAI 5491)

cc:
PTN 6 & 7 Project Manager, AP1000 Projects Branch 1, USNRC DNRL/NRO
Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant 3 & 4

NRC RAI Letter No. 29 Dated July 6, 2011

SRP Section: 09.02.01– Station Service Water

Application Section: 9.2.11– Raw Water System

Question from Balance of Plant Branch 1 (SBPA)

NRC RAI Number: 09.02.01-2 (eRAI 5491)

In accordance with 10 CFR 50, Appendix A, GDC 2, "Design Basis for Protection Against Natural Phenomena," GDC 4, "Environmental and Dynamic Effects Design Bases," and consistent with NRC policy considerations for passive plant designs (for example, SECY 94-084), the staff's review considers whether raw water system (RWS) failures will either adversely affect SSCs that are safety-related or encompassed by regulatory treatment of nonsafety related systems (RTNSS), or impact the control room inhabitants.

Although FSAR Section 9.2.11.1.1, "Safety Design Basis," states that failures of the RWS will not affect the ability of safety-related systems to perform their intended functions, more detailed information is needed to adequately describe the consequences of RWS failures and to explain why safety-related system, structures, and components (SSCs) are not affected. Likewise, additional information is needed in the FSAR to explain why a failure of the RWS (including the RWS storage tank) will not adversely affect RTNSS systems and components or impact the control room, or result in an unacceptable release of radioactive material to the environment.

Accordingly, revise FSAR Section 9.2.11 to address the impact of RWS failures. Include, as appropriate, development of plant-specific inspections, tests, analyses, and acceptance criteria; test program provisions; Technical Specifications; and availability controls.

FPL RESPONSE:

The potential failures of the Raw Water System (RWS) and the corresponding impact on structures, systems, and components that are safety-related or AP1000 equipment Class D are described below.

The RWS does not directly interface with any safety-related system as described in FSAR Section 9.2.11 and shown on FSAR Figure 9.2-201. The RWS storage tank is located greater than 200 feet east of the nearest building or structure within the scope of the AP1000 DCD certification (DCD Figure 1.2.2 and FSAR Figure 1.1-201) and therefore is distant to any safety-related or RTNSS SSCs. Also, RWS piping is not routed in close proximity to any safety-related SSCs. The only RTNSS system that RWS piping is in close proximity to is the Service Water System (SWS).

A resultant flood from a break in the RWS piping is bounded by the analysis for a break in the circulating water system (CWS) piping. DCD Subsection 3.4.1.1.1 indicates that a failure of the CWS cooling tower, the SWS piping, or the CWS piping could result in a potential flood source. However, these potential sources are not located in close proximity to safety-related structures and the consequences of a failure in the yard would be enveloped by the analysis described in DCD Subsection 10.4.5 for failure of the CWS. Likewise, because the RWS storage tank is not located in close proximity to safety-related or RTNSS SSCs, including the control room, the consequences of a failure would be enveloped by the analysis described in DCD Subsection 10.4.5. Site grading is designed to carry water away from safety-related or AP1000 Class D structures, systems, or components.

RWS piping, which supplies water from the RWS storage tank to RWS interface points, is routed in the yard area and inside the turbine building. Water that discharges from a break in the RWS piping prior to securing the ancillary RWS pumps could be a source of flooding in the Turbine Building. A break in the RWS is bounded by a break in the CWS piping. As discussed in DCD Subsection 3.4.1.2.2.3, the bounding flooding source inside the Turbine Building is a break in the CWS piping. Flow from any postulated pipe failures above DCD elevation 100'-0" (Turkey Point Units 6 and 7 equivalent plant NAVD88 elevation is 26'-0") would travel down to DCD elevation 100'-0" via floor gratings and stairwells. There is no safety-related equipment in the Turbine Building. The Component Cooling Water System (CCS) and SWS components on DCD elevation 100'-0", which provide RTNSS support for the Normal Residual Heat Removal System (RNS), are expected to remain functional following a flooding event in the Turbine Building since the pump motors and valve operators are above the expected flood level. Therefore, failures of the RWS piping within the Turbine Building will not adversely impact any safety-related or RTNSS systems, structures, or components.

The RWS-to-SWS interface is at the SWS makeup control valve V009, as shown in DCD Figure 9.2.1-1. The SWS piping is routed from the control valve V009 to the top of the SWS cooling tower basin. There is an air gap between the SWS cooling tower basin water level and the discharge into the basin. The air gap ensures any break upstream of the raw water makeup control valve will not result in the draining of the SWS cooling tower basin.

The RWS provides an alternate dilution source for the liquid radwaste system discharge. The RWS does not have the potential to be a flow path for radioactive fluids due to system interfaces. The liquid radwaste effluent interface is at a point in the wastewater discharge system to the deep injection wells that prevents the effluent from entering the RWS.

In summary, failure of the RWS or its components will not affect the ability of any safety-related systems to perform their intended safety functions nor will it adversely affect any RTNSS systems. Postulated breaks in the RWS piping will not impact safety-related components because the RWS is not located in the vicinity of any safety-related equipment and the water from the postulated break will not reach any safety-related equipment, result in physical impact to the control room, or result in a release of radioactivity to the environment.

Because the RWS is not safety-related and its failure does not lead to the failure of any safety-related systems, the requirements of GDC 2 and 4 and the guidance of SRP 9.2.1, regarding safety-related systems, do not apply.

RWS piping and structures are designed and constructed in accordance with nationally recognized codes and standards (such as ASME/ANSI B31.1 and AWWA). Design features have been included (such as the use of material not susceptible to corrosion for buried piping, redundant pumps and alternate power supplies) to ensure RWS is reliable and will be available to support normal plant operation and shutdown functions.

As noted in FSAR Subsection 14.3.2.3.3, this site-specific system RWS does not meet the ITAAC selection criteria. ITAAC screening was performed for the RWS, using the screening criteria of FSAR Subsection 14.3.2.3, which concluded that ITAAC is not applicable, as indicated in FSAR Table 14.3-201.

No specific Technical Specifications are required for the RWS and none are applicable. Technical Specifications for the AP1000 are discussed in FSAR Chapter 16 and DCD Chapter 16, and were evaluated by the NRC in the FSER (NUREG-1793), Chapter 16.

There are no availability controls for the RWS and they are not required based on the RTNSS evaluation discussed in FSER Chapter 22 and WCAP-15985, Rev. 2. Also, FSAR Chapter 16 and DCD Chapter 16 do not identify any availability requirements for RWS.

No specific change to the FSAR is proposed as a result of this response. A revised FSAR Subsection 9.2.11 is provided as part of the response to PTN RAI 09.02.01-3, and addresses the information discussed in the response to this RAI, as appropriate, consistent with NRC guidance provided in Regulatory Guide 1.206, Section C.III.

This response is PLANT SPECIFIC.

References:

None

ASSOCIATED COLA REVISIONS:

COLA changes associated with this RAI response are provided in the response to RAI 09.02.01-3.

ASSOCIATED ENCLOSURES:

None

NRC RAI Letter No. 29 Dated July 6, 2011

SRP Section: 09.02.01– Station Service Water

Application Section: 9.2.11– Raw Water System

Question from Balance of Plant Branch 1 (SBPA)

NRC RAI Number: 09.02.01-3 (eRAI 5491)

The RWS is relied upon for achieving and maintaining cold shutdown conditions, which is necessary for satisfying Technical Specification requirements. In accordance with NRC policy considerations for passive plant designs, non-safety related active systems that are relied upon for achieving and maintaining cold shutdown conditions (i.e., transitioning from Mode 4 to Mode 5) should be highly reliable and able to accommodate single active failures without a loss of the cooldown capability that is needed. In Section 9.2.11 of the FSAR, provide a clearly defined design basis with respect to the RWS cooldown function. Describe the reliability and capability of the RWS to perform the cooldown function for the most limiting situations. For example, describe the minimum RWS flow rate, water inventory, temperature limitations, and corresponding bases for providing SWS makeup for PTN units 6 and 7. Also, address the suitability of RWS materials for the plant-specific application and measures being implemented to resolve vulnerabilities and degradation mechanisms to assure RWS functionality over time. In sum, revise Section 9.2.11 of the FSAR to fully describe and address the RWS design bases in this regard and to include design specifications that are necessary to ensure the reliability and capability of the RWS to perform its cooldown function. The following guidance should be considered when revising the FSAR in response to this question:

a. The design bases should specifically recognize and describe cold shutdown functions that are credited, and applicable design considerations that pertain to these functions should be specified, such as reliability, redundancy, backup power, etc. Provide a complete description of the relevant design bases in FSAR Section 9.2.11, rather than simply referring to other portions of the DCD.

b. The system description should explain how the applicable design-bases considerations referred to in (a) are satisfied. For example:
• the minimum required system functional capability and the bases for this determination should be described (note that a minimum of seven days worth of on-site water inventory should be available for reactor decay heat removal and spent fuel cooling);
• the description should explain how design-bases considerations are satisfied;
• the guidance in SRP Sections 9.2.1 and 9.2.5 that are relevant for ensuring the capability and reliability of the RWS to perform its design bases functions should be considered and addressed as appropriate (materials considerations, net positive suction head, water hammer, etc.);

• operating experience considerations that pertain to the capability and reliability of the system to perform its design bases functions should be addressed (note that the relevance of operating experience is independent of safety classification considerations);
• in order to demonstrate adequate reliability, the system design should include (among other things) the capability of all necessary components (pumps, valves, strainers, instrumentation and controls, etc.) to function during a loss of off-site power and redundancy for single active failure vulnerabilities;
• dual-unit considerations need to be addressed.

c. Major components and features that are important to ensure the capability and reliability of the system to perform its cooldown function should be described. Applicable industry codes and quality group designations that are commensurate with plant-specific RWS reliability considerations should be specified and reflected in Chapter 3, "Design of Structures, Components, Equipment, and Systems." Note that this may be different from what is specified for the standard plant design since the analysis for the standard design was based solely on regulatory treatment of non-safety systems considerations and did not include consideration of the cooldown function.

d. System design parameters that are important for performing the cold shutdown function should be specified, such as water inventory (RWS storage tank size/volume), flow rate, nominal pipe sizes, limiting flow velocities, and design temperatures and pressures.

e. The RWS operating modes for performing its cold shutdown function should be described, such as interlocks, protective features, and automatic actuation.

f. Limitations on the capability of the RWS to perform its cold shutdown function should be described, such as minimum required water inventory and temperature restrictions that apply.

g. Instrumentation (e.g., indication, controls, interlocks and alarms) that is relied upon by plant operators in the main control room and at the remote shutdown panels for performing cooldown functions should be described.

h. System diagrams should show division designations, flow paths, major components and features, nominal pipe sizes, and instrumentation that is relied upon to ensure proper operation of the system by operators in the main control room and at the remote shutdown panels.

i. The more important periodic inspections that will be completed and specified frequencies for ensuring the capability and reliability of the system should be described. For example, design provisions and actions that will be implemented to periodically assess the condition of buried or otherwise inaccessible piping and components should be described. Specify if non-metallic piping materials such as high density plastic (HDPE) are to be used in the RWS and should be included and described in the FSAR. Include in the FSAR the applicable construction codes for this material.

j. The more important periodic tests that will be completed and specified frequencies for ensuring the capability and reliability of the system should be described. For example, periodic testing of pumps, valves, self-cleaning strainers, and vacuum breakers should be described.

k. Based on the FSAR description, plant-specific ITAAC should be established that are appropriate and sufficient for verifying that the RWS is constructed as designed.

l. The initial test program should test all modes of RWS operation that are credited for its cooldown function and confirm acceptable performance for the most limiting assumptions. For example, confirmation that net positive suction head requirements are satisfied for minimum pump suction head and maximum water temperature conditions with all pumps running at full flow, and that water hammer will not occur during situations when voiding is most likely to occur, should be specified. It should be clear from the information provided in Section 9.2.11 what constitutes acceptable performance.

m. Clarify the specific location of the potable water supply, RWS storage tanks, and raw water ancillary pumps, as they are not described in the FSAR or shown on Figure 1.1-201, "Unit 6 & 7 Layout".

n. Clarify why the RWS is not described in Section 3.2 as a reference (to FSAR 9.2.11.2.1).

o. Identify piping connections for the strainer backwater and media filter backwash from the potable water; they could not be located on Figure 9.2-201 (FSAR 9.2.11.1.2.).

p. Clarify in the FSAR the approximate water volume of the raw water storage tank or explain how many hours are available to supply water to the SWS cooling tower basin if the potable water supply is unavailable due to component or electrical failures.

q. Clarifiy in the FSAR the RWS pump controls or interlocks with the raw water storage tanks relate to pump trips or pump automatic starts, for example pump trips on low water level. Provide a discussion on net positive suction head requirements relevant to pump performance and tank level.

r. Explain how GDC 5 is met, given that the RWS storage tank supplies both units 6 & 7.

FPL RESPONSE:

As described in FSAR Subsection 9.2.11, and shown on FSAR Figure 9.2-201 (Sheet 3 of 3), the RWS interfaces with the SWS. The other functions performed by RWS as described in Subsection 9.2.11 do not have a direct interface with any system identified within the AP1000 DCD as safety-related, designated for Regulatory Treatment of Non-Safety Systems (RTNSS), or designated as AP1000 Class D. Therefore, this response specifically focuses on the RWS interface with the SWS.

The RWS provides a water fill/makeup function for the SWS. SWS has investment protection short-term availability controls, as described in DCD Table 16.3-2, which are applicable in Mode 5 with the Reactor Coolant System (RCS) pressure boundary open and in Mode 6 with the upper internals in place or cavity level less than full. Under these conditions, SWS is directly providing active core cooling and was evaluated by Westinghouse and determined to meet the RTNSS criteria as documented in NUREG-1793 and WCAP-15985. Unlike SWS, RWS does not directly provide core cooling and, as discussed in response to PTN RAI 09.02.01-2, was evaluated in WCAP-15985 and determined to not meet the RTNSS criteria and to not require investment protection short-term availability controls.

It is unlikely that a failure of RWS to provide adequate makeup flow to the SWS cooling tower basins would occur during the short time period in which SWS is performing a RTNSS function, as described above. However, if a failure were to occur, the remaining available inventory in the service water cooling tower basins and the stored water, which is available in the additional excess volume of the secondary fire water tank, would provide ample time (more than 24 hours) to restore the RWS makeup flow or take the procedural actions necessary to exit the conditions for RTNSS applicability. Therefore, RWS is not required to be a RTNSS system or subject to investment protection short-term availability controls. RWS is designed to be a highly reliable and robust system capable of operating during a loss of normal ac power to provide makeup flow to the SWS under normal and abnormal conditions. Procedural controls, which provide for continued operation of the RWS or re-establishment of operations under off-normal conditions, will be contained in operating procedures, where appropriate.

As defined in DCD Subsection 3.2.2.6, a structure, system or component (SSC) is classified as Class D when:

- The SSC directly acts to prevent unnecessary actuation of the passive safety systems, or
- The SSC supports those SSCs which directly act to prevent the actuation of passive safety systems

Class D has normally been applied to AP1000 SSCs that perform defense-in-depth functions. While SWS is designated within the DCD as a defense-in-depth, Class D system, RWS is designated as a Class E system (DCD Table 3.2-3). The basis for this classification is:

- A failure of the RWS will not directly cause an actuation of a passive system nor will it initiate the failure of a SSC, which directly acts to prevent the actuation of a passive safety system.

- In the unlikely event of a failure of the RWS, the inventory in the service water cooling tower basin and available stored inventory in the additional excess volume of the secondary fire water tank ensure that the SWS can maintain the required defense-in-depth cooling functions for an extended period of time.

As described in DCD Subsection 5.4.7.1.2.1, the Normal Residual Heat Removal System (RNS) in conjunction with its associated support systems, Component Cooling Water System (CCS) and SWS (as a support system for CCS), are used for shutdown heat removal. RWS provides indirect support for this function by providing a source of makeup water to the SWS cooling tower basins to compensate for evaporation, drift, and blowdown.

The RWS provides this makeup water to support the cooling requirements for SWS. During a normal plant cooldown, RNS and CCS reduce the temperature of the reactor coolant system from approximately 350°F to approximately 125°F within 96 hours after shutdown. Each unit's RWS is designed to provide ample makeup flow during these conditions using the raw water ancillary pumps.

If cooldown to Cold Shutdown (Mode 5) is required within 36 hours to comply with a Limiting Condition for Operation, in accordance with the Technical Specifications, heat will be transferred from the RCS via the steam generators to the Main Steam System for a longer period of time, allowing RNS to be placed in service at a lower temperature with lower decay heat levels. Because of the reduced RNS heat removal requirements associated with this cold shutdown sequence, the required RWS makeup flow to the SWS cooling towers is less than normal cooldown requirements.

An ample inventory of raw water is available to provide makeup to the SWS cooling tower basins. As noted in FSAR Subsection 9.2.11.2.2.3, a raw water storage tank serving both Turkey Points Units 6 and 7 (Note: GDC-5, Sharing of Structures, Systems, and Components, does not apply since RWS is not an important to safety system as discussed previously) receives potable water supplied from the Miami-Dade Water and Sewer Department (MDWASD). The potable water supply piping enters the Turkey Point Units 6 and 7 plant area from the north and is routed to the raw water storage tank located to the east of Turkey Point Units 6 and 7 (FSAR Figure 1.1-201). The raw water ancillary pumps are located at grade elevation in close proximity to the above ground raw water storage tank, which continually receives makeup from the potable water supply. Should the potable water supply to the raw water storage tank be interrupted, the volume of water in the tank would provide sufficient time to temporarily supply water from another on-site water source, such as reclaimed water from the makeup water reservoir (MWR). The MWR has a capacity well in excess of that needed to support cooldown to cold shutdown conditions and maintain the station in Mode 5 for greater than 7 days.

RWS Design Reliability

Underground RWS piping will be high-density polyethylene (HDPE) which is not susceptible to corrosion. Therefore, periodic inspections of the underground RWS piping are not required.

As discussed above, the lack of designation of RWS as RTNSS or Class D indicates there is no performance requirement for the system during a loss of normal ac power or in the event of a single active failure. Nonetheless, the RWS is highly reliable based on its design. Each raw water ancillary pump can deliver makeup flow to the SWS cooling tower basins to meet demand during all modes of operation. Failure of an operating pump would not prevent the RWS from providing makeup to the SWS cooling towers. In the event of a loss of normal ac power, the raw water ancillary pumps may be manually loaded onto the appropriate diesel bus and may be manually started by the operator. The RWS, therefore, continues to maintain the capability to provide makeup water to the SWS cooling tower basins during the loss of normal ac power events.

As discussed above, in the unlikely event that all RWS flow to the SWS cooling towers is lost, there is ample time to identify and correct the situation or to align alternate sources of water to provide that makeup flow, and RWS is shown to not be a RTNSS system nor subject to investment protection short-term availability controls. It is also important to note that neither the RNS, CCS, SWS, nor RWS are required to establish and maintain the AP1000 plant in a safe shutdown condition, since passive safety-related systems perform that function. This is explicitly recognized throughout the AP1000 DCD and NRC Final Safety Evaluation Report, NUREG-1793.

FSAR Subsection 9.2.11 will be revised to include additional details to address the applicable system attributes requested in items (a) through (r) of this RAI.

This response is PLANT SPECIFIC.

References:

None

ASSOCIATED COLA REVISIONS:

The third paragraph of FSAR Subsection 9.2.11.1.1 will be updated in a future COLA revision, as shown below:

> ~~No interconnections exist between the RWS and any potentially radioactive system.~~ **The RWS does not have the potential to be a flow path for radioactive fluids.**

An additional subsection header will be added to FSAR Subsection 9.2.11.1.2 in a future COLA revision, as shown below:

> 9.2.11.1.2 Power Generation Design Basis
>
> **9.2.11.1.2.1 Normal Operation**
>
> The RWS provides a continuous supply of makeup water from 3 separate sources to the following services: (Figure 9.2-201 shows which sources supply which services).

The second to last bullet of FSAR Subsection 9.2.11.1.2 will be updated in a future COLA revision, as shown below:

- Providing the water for ~~the~~ **miscellaneous plant uses such as** strainer backwash and ~~the~~ media filter backwashes (source: potable water)

An additional subsection will be added to the end of FSAR Subsection 9.2.11.1.2 in a future COLA revision, as shown below:

- Providing dilution flow required for liquid radwaste discharge (sources: reclaimed water and/or saltwater)

> **9.2.11.1.2.2 Outage Mode Operation**
>
> **During plant outages, the RWS provides water to the same services as during normal operation with the exception of circulating water system makeup.**

The first and second paragraph of FSAR Subsection 9.2.11.2.2.3 will be updated in a future COLA revision, as shown below:

> **Raw Water Storage Tank**
>
> A raw water storage tank is provided for Units 6 & 7. This tank receives water from the MDWASD potable water supply. **Should the potable water supply to**

the storage tank be interrupted, the volume of water in the tank provides sufficient time to facilitate a temporary supply of water to the service water cooling tower basins from another on-site water source, such as reclaimed water from the makeup water reservoir (MWR). The MWR has a capacity well in excess of that needed to support cooldown to cold shutdown conditions and maintain the station in Mode 5 for greater than 7 days.

Raw Water Ancillary Pumps

Two 100-percent raw water ancillary pumps per unit draw water from the raw water storage tank to supply the required flow for the services and functions listed in Subsection 9.2.11.1.2. They are powered from the normal ac power system. The raw water ancillary pumps can be manually loaded onto the standby diesel generators **to provide makeup to the service water cooling tower basins, if necessary, following a loss of normal ac power.**

The following updates will be made to FSAR Subsection 9.2.11.4 in a future COLA revision:

The RWS has no safety-related function and therefore requires no nuclear safety evaluation. ~~The RWS has no interconnection with any system that contains radioactive fluids.~~

The RWS does not have the potential to be a flow path for radioactive fluids. The RWS has no direct interconnection with any system that contains radioactive fluids. The liquid radwaste effluent interface is at a point in the wastewater discharge system to the deep injection wells that prevents the effluent from entering the RWS.

A new paragraph will be added before the first paragraph of FSAR Subsection 9.2.11.5 in a future COLA revision, as shown below:

9.2.11.5 Test and Inspections

Initial test requirements for the RWS are described in Subsection 14.2.9.4.24.

A new paragraph will be added before the second paragraph of FSAR Subsection 9.2.11.6 in a future COLA revision, as shown below:

Level instrumentation is provided at the raw water storage tank to allow the tank level to be monitored and to control the flow of the MDWASD supplied potable water to the tank. Abnormally high or low water levels in the tank will be alarmed in the control room.

Level instrumentation on the fire water tanks automatically opens the fill valve on low tank level and closes on high level.

ASSOCIATED ENCLOSURES:

None

NRC RAI Letter No. 29 Dated July 6, 2011

SRP Section: 09.02.01– Station Service Water

Application Section: 9.2.11– Raw Water System

Question from Balance of Plant Branch 1 (SBPA)

NRC RAI Number: 09.02.01-4 (eRAI 5491)

While the service water system (SWS) is designated for RTNSS during reduced reactor inventory conditions, it does not appear that the RWS is needed to support the SWS cooling function during this condition because RWS is not designated for RTNSS. Explain in Section 9.2.11 why this is the case. Also, because the SWS cooling tower basins are very limited in their capacity, explain why RWS makeup would not be required for this situation. In summary, revise Section 9.2.11 to explain why RWS makeup is not needed during reduced reactor inventory conditions and in particular, describe controls that will be implemented to ensure that SWS makeup assumptions are valid for this situation.

FPL RESPONSE:

Please refer to the response to PTN RAI 09.02.01-3 for an explanation of why the raw water system (RWS) is not designated as regulatory treatment of nonsafety systems (RTNSS) and makeup from the RWS to the service water system (SWS) cooling tower basins is not required during reduced reactor coolant system (RCS) inventory conditions. The referenced RAI response also discusses that procedural controls will be established to take the required actions to exit the conditions for applicability of the SWS as a RTNSS system, in the unlikely event of a failure to re-establish RWS makeup capability. The system description for the RWS in FSAR Section 9.2.11 will include the information addressed in these RAI responses, as appropriate.

This response is PLANT SPECIFIC.

References:

None

ASSOCIATED COLA REVISIONS:

COLA changes for this RAI response are provided in the response to RAI 09.02.01-3.

ASSOCIATED ENCLOSURES:

None

NRC RAI Letter No. 29 Dated July 6, 2011

SRP Section: 09.02.01– Station Service Water

Application Section: 9.2.11– Raw Water System

Question from Balance of Plant Branch 1 (SBPA)

NRC RAI Number: 09.02.01-5 (eRAI 5491)

As specified by 10 CFR 20.1406, COL applicants are required to describe how facility design and procedures for operation will minimize the generation of radioactive waste and contamination of the facility and environment, and facilitate eventual plant decommissioning. Although the RWS has no interconnections with any systems that contain radioactive fluids, industry experience has shown that this alone may not be sufficient to prevent the RWS from becoming contaminated. For example, unplanned leaks or release of contaminated fluids as a result of component failures or transport, drainage problems in contaminated areas, and the migration of contamination through soils and other porous barriers over time have caused systems and areas of the plant that are not directly connected with contaminated systems to become contaminated. The staff requests that the applicant describe any applicable design provisions and other measures that will be implemented to satisfy 10 CFR 20.1406 with respect to the RWS, including measures that will be implemented to monitor the RWS for contamination and corrective actions that will be taken to eliminate any radioactive contamination that is identified. RG 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," provides guidance that may be used for addressing the requirements specified by 10 CFR 20.1406.

FPL RESPONSE:

As described in FSAR Subsection 9.2.11, "Raw Water System" (RWS), reclaimed water from the Miami-Dade Water and Sewer Department (MDWASD) is supplied to the FPL reclaimed water treatment facility. Water from the reclaimed water facility is then stored in the makeup water reservoir for use as makeup to the Circulating Water System (CWS) mechanical draft cooling tower basins. Also as described in Subsection 9.2.11, saltwater from beneath Biscayne Bay is used for makeup to the CWS cooling tower basins directly when reclaimed water is unavailable in sufficient quantity and/or quality. As further described in Subsection 9.2.11, potable water from the MDWASD is supplied to the raw water storage tank for makeup to the Service Water System (SWS) mechanical draft cooling tower basins, Demineralized Water Treatment System, and Fire Protection System. The reclaimed water or saltwater portions of the RWS also provide an alternate dilution source for liquid radwaste discharge when CWS cooling tower blowdown is not available.

Potential failures of the plant systems causing external and internal flooding are described in DCD Section 3.4 and potential sources that could transport contaminants to the RWS are monitored per DCD Section 11.5.

As described in DCD Section 11.5, the Radiation Monitoring System (RMS) provides plant effluent monitoring, process fluid monitoring, airborne monitoring, and continuous indication of the radiation environment in plant areas where such information is needed.

Compliance with 10 CFR 20.1406:

In support of Combined License Application pre-application activities, Westinghouse has submitted to the NRC the report, AP1000 Standard Combined License Technical Report APP-GW-GLN-098, Revision 0, "Compliance with 10 CFR 20.1406", dated April 10, 2007. This report summarizes the design approach and features incorporated into the AP1000 standard plant design that demonstrate compliance with 10 CFR 20.1406. The plant features described in this report will minimize contamination and radioactive waste generation for the AP1000 design.

Groundwater Transport:

Subsection 2.4.13 of the FSAR presents an analysis of the effect of an accidental release of liquid effluents to the groundwater environment through the postulated failure of the liquid waste system effluent holdup tank. The analysis presented in FSAR Subsection 2.4.13 is currently being revised and will be presented in a future COLA revision.

Groundwater Monitoring Program:

In accordance with 10 CFR 20.1406 and as covered in Westinghouse Technical Report APP-GW-GLN-098, a groundwater monitoring program beyond the normal radioactive effluent monitoring program will be developed. FSAR Subsection 12AA.5.4.14 lists locations of areas to be monitored for the AP1000 design and states a groundwater monitoring program will be developed.

Groundwater monitoring program implementation considerations are also described in FSAR Subsection 12AA.5.4.13. A Record of Operational Events of Interest for Decommissioning is described in FSAR Subsection 12AA.5.4.15.

Based on the above monitoring program, unplanned leakage or release of contaminated fluids will be detected.

Conclusion:

The RWS piping system interfaces do not provide a potential to be a flow path for radioactive fluids, as indicated in FSAR Subsection 9.2.11.1.1 and shown in FSAR Figure 9.2-201. Also, the possibility of contaminating the RWS from a release to the subsurface environment from Turkey Point Units 6 & 7 is remote.

Therefore, direct monitoring of the RWS for contamination is not required.

This response is PLANT SPECIFIC.

References:

None

ASSOCIATED COLA REVISIONS:

FSAR Subsection 9.2.11 changes for this RAI response are provided in PTN RAI 09.02.01-3. FSAR Subsection 2.4.13 will be updated in a future COLA revision.

ASSOCIATED ENCLOSURES:

None